

App. No. 10/695,302
Office Action Dated January 24, 2006

REMARKS

Reconsideration is respectfully requested in view of the above amendments and following remarks. The abstract has been amended editorially, taking the issue noted in the Office Action into account. The title has been amended to "Method for Manufacturing Printed Circuit Board." Claims 17, 19, 23 and 27 have been amended editorially. Claims 25-26 were canceled in the Voluntary Amendment filed November 7, 2005. Claims 16-24 and 27 are pending.

Claim rejections - 35 U.S.C. § 112

Claims 17-19, 23 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to claim the subject matter of the present invention. Claims 17, 19, 23 and 27 have been amended editorially, taking the issues in the rejection into account. As for claim 18, "in a prepeg stage comprising a void" refers to the stage when the void is present in the prepeg. This occurs when the glass cloth or glass nonwoven fabric as a reinforcing material is impregnated with the thermosetting epoxy resin (see page 9, lines 6-30 for example). As for claim 23, the claim provides for a method of manufacturing a multilayer printed circuit board, thereby further limiting claim 16. Applicants respectfully submit that claims 17-19, 23 and 27 are definite.

Favorable reconsideration and withdrawal of the rejection are respectfully requested.

Claim rejections - 35 U.S.C. § 102

Claims 16-24 and 27 are rejected under 35 U.S.C. 102(b) a being anticipated by US Patent No. 5,888,627 (Nakatani). Applicants respectfully traverse this rejection.

Claim 16 requires the step of forming a dielectric substrate of a pre-preg by impregnating a glass cloth or a glass nonwoven fabric with a thermosetting epoxy resin mixed with fine particles. When the fine particles are mixed with the thermosetting epoxy resin, the melting viscosity of the epoxy resin is raised. As such, resin flow occurring at an interface between the dielectric substrate and a metal foil can be controlled at the time of applying heat and pressure. By controlling resin flow in this way, the epoxy resin is prevented from entering the interface between the metal foil and the conductor. As a result, the conductor is provided with sufficient compression and this leads to stable connection reliability (see page 15, lines 9-14 and Fig. 10 for example).

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Moreover, by mixing the fine particles with the thermosetting epoxy resin, the coefficient of thermal expansion (CTE) of the dielectric substrate in the thickness direction can be decreased. Thus the CTE values can approach the CTE of an interstitial via conductor and improve connection reliability between the wiring pattern and the interstitial via conductor (see page 15, lines 15-19 for example).

Nakatani discloses the step of forming a dielectric substrate containing inorganic filler. However, this step involves pasting a resin component layer that contains inorganic filler to both sides of an organic nonwoven fabric (column 8, lines 32-45). As such, only the outside layers of the resulting dielectric substrate contain inorganic fillers. On the other hand, claim 16 requires a glass cloth or a glass nonwoven fabric to be impregnated with thermosetting epoxy resin mixed with fine particles so as to raise the viscosity of the epoxy resin throughout the entire thickness of a glass cloth or a glass nonwoven fabric (see Fig. 10 and page 15, lines 6-10 for example). Therefore, the reference does not anticipate claim 16. Further, there is no suggestion by Nakatani to control resin flow by raising the melting viscosity of the epoxy resin so as to prevent its entry into the interface and thereby improve connection reliability. Therefore, claim 16 is patentable over Nakatani.

Claims 17-24 and 27 depend from, and further limit claim 16. Therefore, claims 17-24 and 27 are patentable over Nakatani for at least the same reasons as claim 16.

Favorable reconsideration and withdrawal of the rejection are respectfully requested.

In view of the above, favorable reconsideration in the form of a notice of allowance is requested. Any questions or concerns regarding this communication can be directed to the attorney-of-record, Douglas P. Mueller, Reg. No. 30,300, at (612) 455.3804.

Respectfully Submitted,

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